2010 Smile Survey Summary

King County

December, 2010

Public Health
Seattle & King County

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Introduction

Dental disease is a preventable but common chronic problem in children that affects their ability to eat, sleep and learn, according to the *2000 Surgeon General's Report on Oral Health*. The Report highlights that dental problems are more prevalent in certain racial/ethnic and socio-economic groups. Public Health – Seattle & King County monitors the oral health of children to provide data to communities and agencies to help address this problem.

In 2010, as part of an oral health assessment conducted every five years, the Washington State Department of Health conducted a statewide oral health Smile Survey of 5,741 elementary school children in Kindergarten and 3rd Grade and 1,597 children in Head Start/ECEAP programs. King County conducted an additional survey of 4,000 elementary school children and 380 children in Head Start/ECEAP programs. King County data from the State sample combined with the King County sample show that, while children in King County enjoy better oral health status than children in Washington State, there are persistent disparities in oral health status for children from low-income families, children of color, and children whose primary language is not English.

Key Findings – King County Survey

- Children in King County continued to have less dental disease than did children in other areas of Washington State. 80% of King County residents have access to fluoridated water, which probably contributed to the better oral health status of King County children.

- Children eligible for the Free/Reduced Lunch program (a proxy for low-income status) were at least twice as likely to have untreated dental disease as children not eligible for the program. (Same finding in 2005 Smile Survey)

- Children of color were twice as likely to have untreated dental disease as were white children. (Same finding in 2005 Smile Survey)

- The rates of Dental Sealants in 3rd Grade students exceeded the Healthy People 2010 goal. In schools in King County with school-based dental sealant programs, children had higher rates of Dental Sealants than did students in schools without these programs. .

Methods

In 1996, the Washington State Department of Health (DOH) conducted its first statewide survey to help monitor the trends of dental disease in children. The "survey" was a school-based oral health screening of children by dental professionals. In 2000, as part of the second statewide survey, Public Health –Seattle & King County (Public Health) conducted its first random sample survey of 2nd and 3rd Grade students throughout King County. In 2005, Public Health participated in the third Smile Survey, conducting a county wide random survey of 2nd and 3rd

Grade students, as well as a random survey specific to Seattle students. In 2005, DOH added a survey of children in a random sample of Head Start and Early Childhood and Education Assistance Programs (ECEAP). Public Health also surveyed children in a random sample of preschool sites throughout King County.
In 2010, DOH changed the survey to obtain information that could be used to compare Washington State data to those of other states nationwide. Kindergarten and 3rd Grade students were targeted since these are the groups surveyed by other states. DOH also surveyed children in Head Start/ECEAP programs. DOH drew random samples of schools for the State survey and the King County survey.

The methodology used for drawing samples for both the State survey and the King County survey (as described by DOH) :

> *A list of all public schools was obtained from the Washington State Office of the Superintendant of Public Instruction (OSPI) for use in determining the sample. The data file contained the total enrollment of all students as well as that of K and 3rd grade students and number of students enrolled in the Free and Reduced Lunch (FRL) program for each public school in the state. Schools were included in the sampling frame if they had 15 or more students in K and 3rd grade and a total population of 25 students in the combined K and 3rd grades. Those that failed to meet either criterion were excluded. The remaining schools were then ranked from highest to lowest according the percent of all students' participation in the FRL program and given a unique ID number for selection purposes.*
>
> *Concurrently the number of schools to be sampled was determined. The sampling methodology took into consideration the design effect of the study and assumed a 79% response rate. The design effect and response rate were estimated based on the 2005 smile survey. Sample sizes were calculated based on expected caries prevalence of 50% and three different confidence interval ranges, +/- 3%, +/- 4% and +/- 5%. In a meeting with Oral Health staff it was decided, for budgetary reasons, to proceed with the +/- 5% precision level. This decision resulted in a final sample size of 3,606 children. Based on an average 3rd grade enrollment size of 71, 51 schools were determined to be the final sample size. The formula used for sample size calculation is* $n = deff \cdot pq(1.96/0.05)^2$ *Deff is design effect , p is prevalence, and q is 1-p.*
>
> *SAS procedure SURVEYSELECT for systematic sampling was used to draw the sample, based on the percent of reduced or free lunch in a school. The sample was distributed by Oral Health staff to the Local Health Jurisdictions in which the schools were located.*

The elementary school sample for the King County survey included 32 schools with 4,000 children participating, for a response rate of 84%. The King County sample included some schools also drawn for the State sample.

Participating school sites had the option of participating with positive consent or passive consent. Positive consent requires that parents sign their children up to participate, whereas passive consent allows children to be screened unless parents indicate otherwise. The same oral health measures and demographic information (race, language and FR/L participation) were collected regardless of the type of consent determined by the school.
Dental professionals conducted screenings on site, after DOH training to assure consistency in assessments. This type of dental screening underreports dental disease, because no x-ray or other diagnostic tools are used. of The increased use of tooth colored filling materials, which are harder to see than amalgam filling material, also increases the difficulty of using only visual techniques to report absence of fillings.

Student characteristics included age, gender, race/ethnicity, language spoken at home, and, for elementary students, eligibility for free and/or reduced price lunch program (FRL) as a proxy for overall socioeconomic status. Information on eligibility for free and/or reduced lunch programs was obtained through the school districts' Nutrition Services programs. Data on race/ethnicity and language spoken at home were provided by individual schools based on parent/guardian enrollment information. After the screening, all students were identified by an ID number and all names were removed to ensure confidentiality. Oral health indicators included Caries Experience (either untreated or treated decay), Untreated Caries (Decay), Treated Caries (Decay), Rampant Caries (decay on seven or more teeth), Dental Sealants and Treatment Urgency. Treatment Urgency is not discussed in this report. It was found in less than 1% of elementary children and in no child in Head Start. Data were entered and analyzed using the EPI-INFO program from the Centers for Disease Control and Prevention (CDC). Complete data tables are listed in the Appendix to this report. Tables of data weighted for non-response are included to demonstrate that there were no significant differences between the weighted and unweighted data. Weights were determined by dividing the number of children actually screened in any given school by the number of children enrolled in the grades of interest, K and 3rd. All data reported in the body of the report, including the data from Washington State results, are unweighted.

2010 Smile Survey Findings

Overall Survey Findings for Elementary School Children

The 2010 Washington State Smile Survey sample included 5,733 Kindergarten and 3rd Grade children. Eight participants were missing grade level information and were not included in the data. Each participating county had a county level sample drawn. In King County, this was a total of 4,000 children.

King County children were more likely to be caries free (no Treated or Untreated Decay) and to have less Treated Decay (fillings) than were children living in other areas of Washington State. King County's 2010 advantage in child oral health is consistent with findings from previous Smile Surveys. While there was no difference in the 2010 rate of Untreated Decay between King County and the rest of the state, King County children had a significantly lower rate of Rampant Decay. Since Rampant Decay is measured as treated or Untreated Decay on 7 or more teeth, this suggests that the difference in Rampant Decay reflected differences in the Treated Decay rate. King County data showed significantly less Treated Decay and less Rampant Decay compared to the data from Washington State. The rates of Dental Sealants in 3rd Grade students remained significantly higher in King County than in the rest of the state.

Table 1: Oral Health Measures for Screened Elementary School Children, Washington State and King County, 2010

Oral Health Measure	WA State (n=5,733)	King County (n= 4,000)
*Caries Free (no treated or untreated)	**51%** CI (50.1% - 52.7%)	**60%** CI (58.7% - 61.8%)
*Caries Experience	**49%** CI (47.3% - 49.9%)	**40%** CI (38.2% - 41.3%)
*Treated Decay	**41%** CI (39.6% - 42.2%)	**31%** CI (29.5% - 32.4%)
Untreated Decay	**14%** CI (13.5% - 15.3%)	**15%** CI (14.3% - 16.6%)
*Rampant Decay	**17%** CI (15.9% - 17.9%)	**13%** CI (11.6% - 13.7%)
*Dental Sealants (3rd Graders only)	**51%** CI (49.4% - 53.1%)	**63%** CI (60.3% - 64.7%)

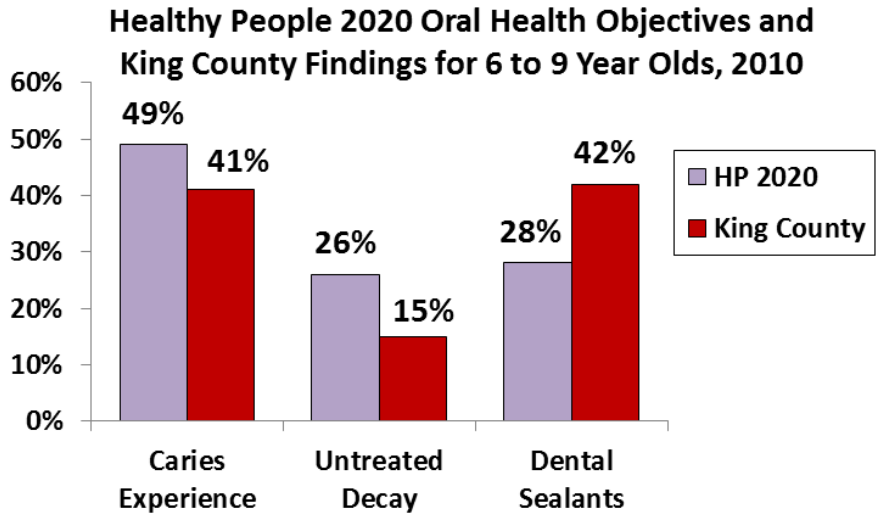
*Significant difference between State and King County samples

Oral health objectives from the national Healthy People 2020 Oral Health Goals for children ages 6 to 9 are:

Reducing the proportion of children who have dental Caries Experience to 49%
Reducing the prevalence of untreated tooth decay to 26%
Increasing the proportion of children who have Dental Sealants to 28%

In data for the 3,078 King County participants aged 6 to 9, the rate for King County children exceeded the HP 2020 objectives in Caries Experience, Untreated Decay and Dental Sealants.. The objective for parents, dental professionals and health care agencies in King County is to

maintain these achievements for future 6 to 9 year old children. State data for this specific age group are not available for this county report.



Grade Specific Findings for Elementary School Children

Reflecting the substantial differences in oral health measurements between Kindergarten and 3rd Graders sampled in the 2010 Smile Survey, comparisons in the following tables are broken down by grade level. Kindergarten students are unlikely to have many permanent teeth, especially permanent molars. Dental Sealants are only applied on permanent molars, which is why that measurement is reported only for 3rd Graders. There can be age-related differences in decay experience as well as differences in accessing dental care.

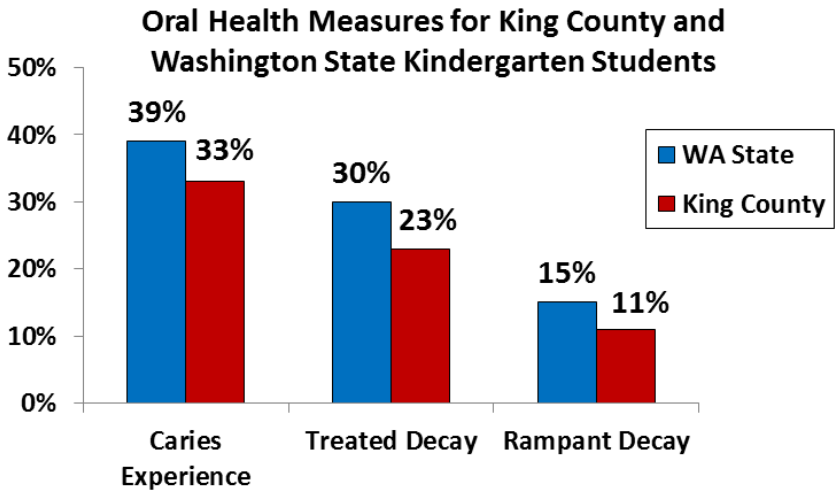
Table 2: Oral Health Measures for Screened Kindergarten Children, Washington State and King County

Oral Health Measure	WA State (n=2,858)	King County (n= 2,073)
*Caries Free (no treated or untreated)	61% CI (58.9% - 62.6%)	67% CI (64.7% - 68.4%)
*Caries Experience	39% CI (37.4% - 41.1%)	33% CI (31.6% - 35.3%)
*Treated Decay	30% CI (28.6% - 32.0%)	23% CI (21.6% - 25.3%)
Untreated Decay	14% CI (12.5% - 15.1%)	15% CI (13.2% - 16.3%)
*Rampant Decay	15% CI (13.2% - 15.8%)	11% CI (10.0% - 12.5%)

*Significant difference between State and King County samples

Kindergarten students in King County were more likely to be Caries Free and had less Caries Experience than those in Washington State. This is seen in the difference in Treated Decay, where King County children had a lower rate of fillings, and in a lower rate of Rampant Decay

(fillings or decay on 7 or more teeth). The rates of Untreated Decay were not statistically different.

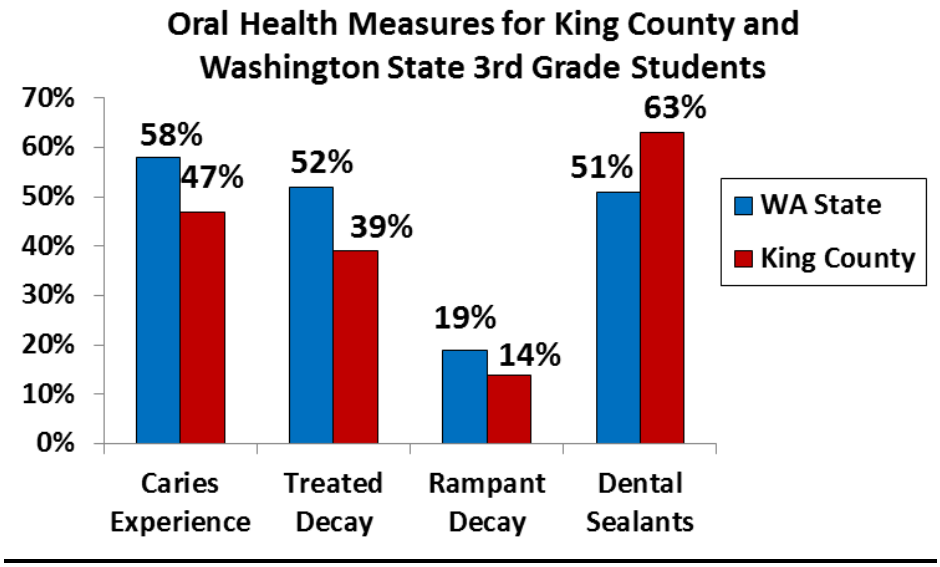


A comparison of 3rd Grade students showed a similar pattern. In King County, 3rd Grade students were more likely to be decay free, to have less Treated Decay and less Rampant Decay; and were also more likely to have Dental Sealants than 3rd Grade students from other areas of Washington State. King County and State rates of Untreated Decay were not statistically different.

Table 3: Oral Health Measures for Screened 3rd Graders, Washington State and King County

Oral Health Measure	WA State (n=2,875)	King County (n=1,927)
*Caries Free (no treated or untreated)	**42%** CI (40.3% - 43.9%)	**53%** CI (21.0% - 55.5%)
*Caries Experience	**58%** CI (56.1% -59.7%)	**47%** CI (44.5% - 49.0%)
*Treated Decay	**52%** CI (49.6% - 53.3%)-	**39%** CI (36.9% - 41.4%)
Untreated Decay	**15%** CI (13.6% - 16.3%)	**16%** CI (14.6% - 17.9%)
*Rampant Decay	**19%** CI (17.8% - 20.7%)	**14%** CI (12.4% - 15.5%)
*Dental Sealants (3rd Graders only)	**51%** CI (49.4% - 53.1%)	**63%** CI (60.3% - 64.7%)

*Significant difference between State and King County samples



Disparities in Burden of Oral Disease

The Smile Survey recorded information on participation in Free/Reduced Lunch programs, race/ethnicity, and language spoken at home. Findings from the survey show that children from low income families, children from families of color, and immigrant/refugee families were significantly more likely to suffer from dental disease compared to children from middle or higher income families, non-minority children and children born in the US.

Burden of Disease Higher in Low-Income Children

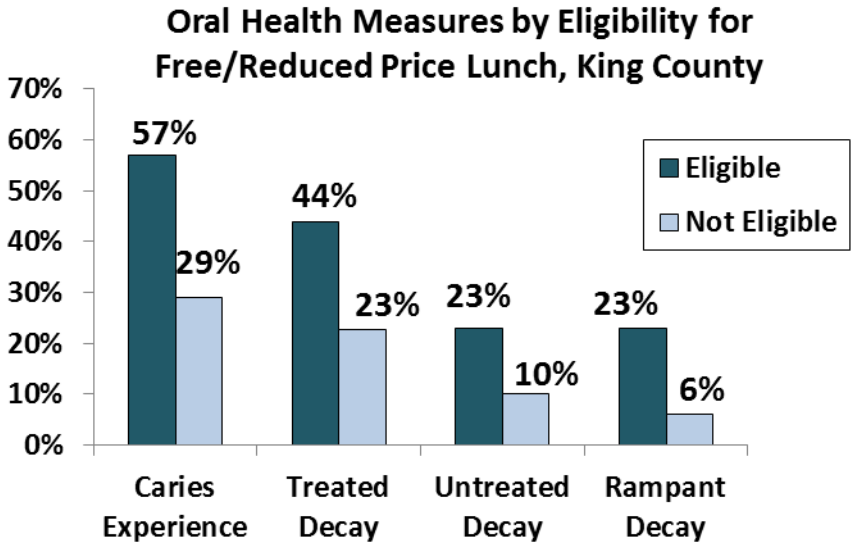
Participation in the Free and/or Reduced Lunch program (FRL) is often used as a proxy for low income, as the income standards correspond to 130% and 185% of the Federal Poverty Level. . Based on this measure, the Survey found that King County children from low-income families had higher rates of dental disease.

Table 4: Oral Health Measures by Free/Reduced Lunch Eligibility, Screened King County Elementary Students

Oral Health Measure	Not Eligible (n=2,433)	Eligible (n=1,555)
*Caries Experience	29% CI (27.1% - 30.8%)	57% CI (54.0% - 59.0%)
*Treated Decay	23% CI (19.5% - 25.2%)	44% CI (37.3% - 48.1%)
*Untreated Decay	10% CI (9.1% - 11.5%)	23% CI (21.3% - 25.5%)
*Rampant Decay	6% CI (5.1% - 7.0%)	23% CI (21.0% - 25.2%)

*Significant difference between FRL eligible and not eligible samples

Students eligible for FRL programs in King County were almost twice as likely to have experienced dental decay; twice as likely to have Treated Decay, at least twice as likely to have Untreated Decay; and almost four times as likely to have Rampant Decay as were students not eligible for FRL programs.



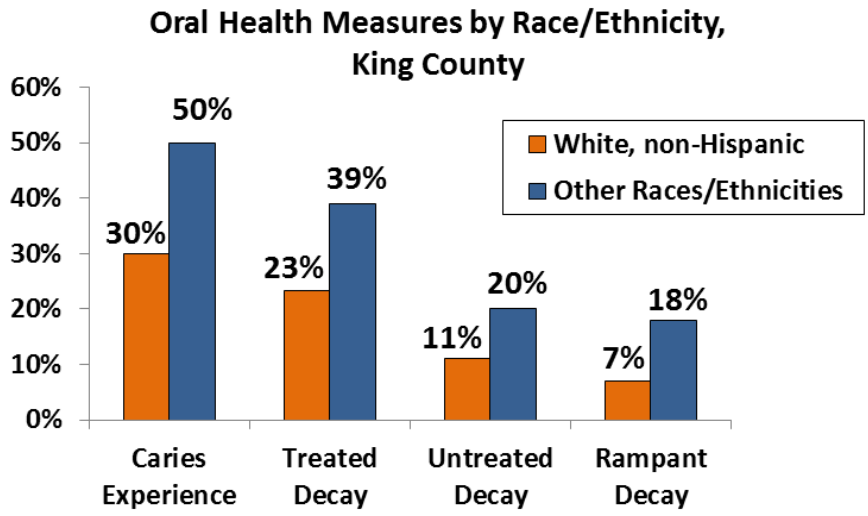
Disparities in Oral Health Exist by Race and Ethnicity

Dental disease affects children of color (Hispanic/Latino, African-American, American Indian/Alaska Native, Asian and Other Races) at a significantly higher rate than white, non-Hispanic children. In Smile Survey data, white non-Hispanic children showed significantly lower Caries Experience and Untreated Decay rates. Children of color had one and a half times the rate of dental disease (Caries Experience and Treated Decay), twice as much difficulty in accessing dental care (Untreated Decay) and three times the rate of dental disease (Rampant Caries) as did white, non- Hispanic children.

Table 5: Oral Health Measures by Race/Ethnicity, Screened King County Elementary Children

Oral Health Measure	White, non-Hispanic (n=2,308)	Other Races/Ethnicities (n=1,937)
*Caries Experience	**30%** CI (28.1% - 32.1%)	**50%** CI (47.5% - 52.0%)
*Treated Decay	**23%** CI (19.3% - 26.2%)	**39%** CI (33.6% - 42.4%)
*Untreated Decay	**11%** CI (9.5% - 12.2%)	**20%** CI (18.5% - 22.2%)
*Rampant Caries	**7%** CI (6.3% - 8.6%)	**18%** CI (16.5% - 20.0%)

*Significant difference between white, non-Hispanic and Other Race/Ethnicity samples

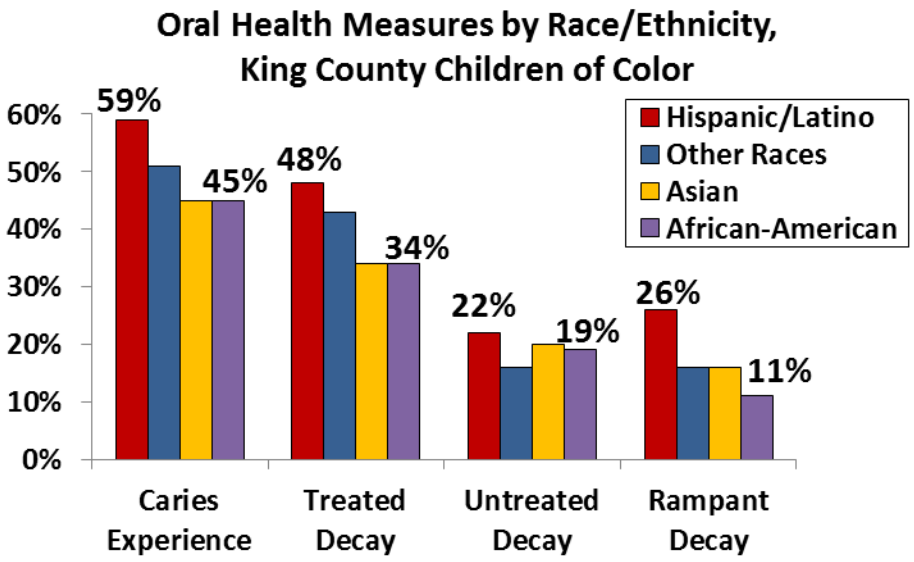


Among elementary children of color in the King County survey, Hispanic/Latino children had significantly higher rates of Caries Experience and Treated Decay than did African-American and Asian children. Hispanic/Latino children were significantly more likely to have Rampant Decay than were all other children of color. There was no statistical difference in the rates of Untreated Decay among the groups.

Table 6: Oral Health Measures by Race/Ethnicity, Screened King County Elementary Children of Color

Oral Health Measure	African American n=505	Hispanic/Latino n=624	Asian n=672	Other Races n=136
*Caries Experience	45% CI (40.8% - 49.6%)	59% CI (54.7% - 62.5%)	45% CI (41.0% - 48.6%)	51% CI (42.0% - 59.4%)
*Treated Decay	34% CI (26.9% - 41.8%)	48% CI (40.0% - 54.3%)	34% CI (27.4% - 39.7%)	43% CI (32.1% - 58.4%)
Untreated Decay	19% CI (15.7% - 22.8%)	22% CI (19.1% - 25.8%)	20% CI (17.3% - 23.5%)	16% CI (10.4% – 23.5%)
*Rampant Decay	11% CI (9.3 – 15.1%)	26% CI (23.1 – 30.1%)	16% CI (13.0% - 18.6%)	16% CI (10.4 – 23.5%)

*Significant differences among groups



Disparities in Oral Health Exist When Language Other than English Spoken at Home

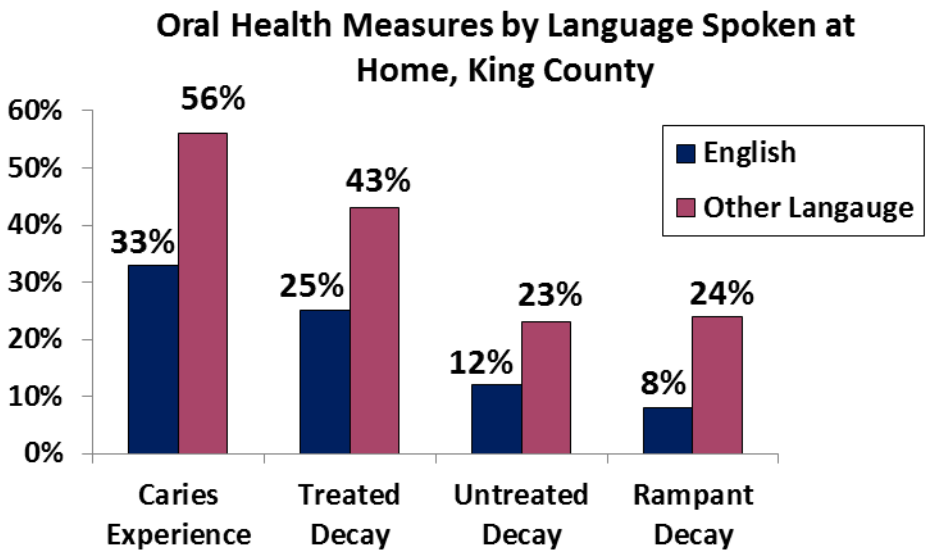
King County data showed a difference in oral health measures between students with English as a primary language and those whose families spoke another language at home. Schools were asked which home language parents/guardians designated when the student was registered. This measure combined students newly arrived in the United States and those whose families have been living in the country for a longer period but maintain original cultural ties.

Table 7: Oral Health Measures by Language Spoken at Home, Screened King County Elementary Children

Oral Health Measure	English (n=2,992)	Other Language (n=1,177)
*Caries Experience	33% CI (31.1% - 34.7%)	56% CI (52.9% - 58.7%)
*Treated Decay	25% CI (21.7% - 27.6%)	43% CI (36.3% - 47.6%)
*Untreated Decay	12% CI (11.2% - 13.8%)	23% CI (20.4% - 25.3%)
*Rampant Caries	8% CI (7.0% - 9.1%%)	24% CI (21.6% - 26.6%)

*Significant difference between English and non-English speaking sample

Students whose primary language was not English were more likely to have Caries Experience and Treated Decay; almost twice as likely to have Untreated Decay, and three times as likely to have Rampant Decay, compared to those whose families spoke English at home.



Protective Measures - Dental Sealants (3rd Graders only)

Dental Sealants are an evidence-based strategy to prevent dental decay. Dental Sealants are protective coatings applied to the grooves and pits of permanent molars, which are the tooth areas shown to be most vulnerable to decay. Among the 1,927 King County 3rd Graders who participated in Smile Survey 2010, there were no economic, race/ethnic or language differences in application of dental sealants. This was the only oral health measure that did not show any disparities.

Table 8: Dental Sealants by Free Reduced Lunch Eligibility, Screened King County Third Graders

	Not Eligible n=1,120	Eligible n=807
Dental Sealants	**61%** CI (58.0%% - 63.8%)	**65%** CI (61.4% – 68.1%)

Table 9: Dental Sealants by Race/Ethnicity, Screened King County Third Graders

	White, non-Hispanic n=965	Other Races/Ethnicities n=962
Dental Sealants	**62%** CI (59.2% - 65.4%)	**63%** CI (59.5% – 65.7%)

Table 10: Dental Sealants by Language Spoken at Home, Screened King County Third Graders

	English n=1,257	Other Language n=670
Dental Sealants	**62%** CI (59.2% - 64.7%)	**64%** CI (59.8% - 67.2%)

The school-based Dental Sealant programs conducted by Public Health – Seattle & King County began in the Seattle School District in 1986. High risk schools are targeted based on Free Reduced Lunch percentages (30% or greater), and the program is offered to all 2nd Grade students in those targeted schools. In 1995 the program was expanded to include high risk schools in other King County school districts. The 2010 Smile Survey included 11 schools that participated in the school-based dental sealant program the previous year. 3rd Grade students from schools with dental sealant programs were significantly more likely to have Dental Sealants than those from schools without a school-based dental sealant program.

Table 11: Dental Sealants by School Based Sealant Program, Screened King County Third Graders

	School Based Program (n=436)	No School Based Program (n=769)
***Dental Sealants**	**70%** CI (66.4% - 73.8%)	**59%** CI (56.2 – 61.6%)

* Significant difference

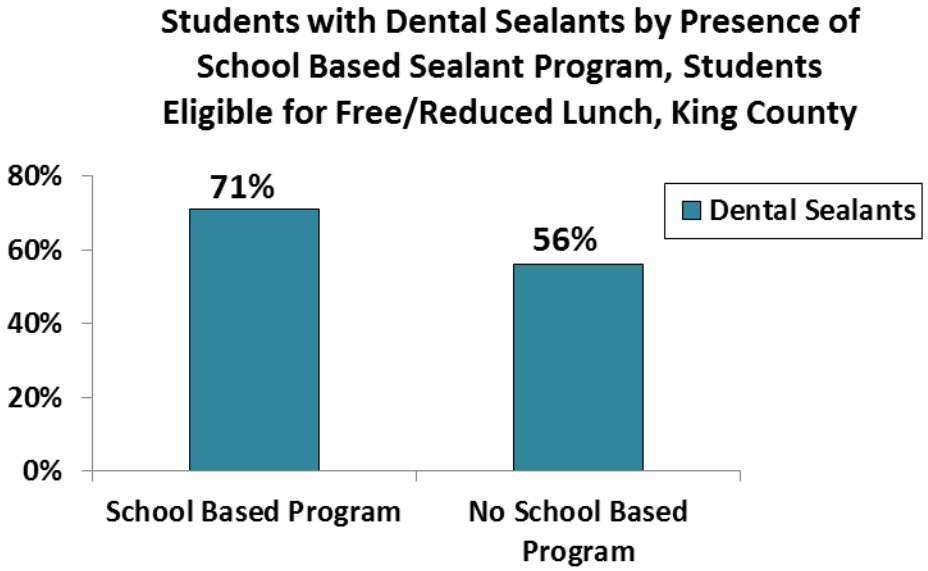
Of 1,927 3rd Grade students, 807 (42%) were eligible for the Free Reduced Lunch program, which is a proxy measure for low income. 3rd Grade students eligible for the Free /Reduced Lunch program were significantly more likely to have Dental Sealants if they attended a school with a school based sealant program than if they attended a school that did not have a sealant program.

Table 12: Dental Sealants by School Based Sealant Program, Screened King County Students Eligible for Free/Reduced Lunch

Students Eligible for Free/ Reduced Lunch n= 807	School Based Program (n=464)	No School Based Program (n=343)
*Dental Sealants	71% CI (66.7% - 75.2%)	56% CI (50.8% – 61.6%)

* Significant difference

These findings suggest that school based sealant programs are an improved way to deliver this proven preventive measure to students at higher risk for dental disease.



Comparing the 2005 & 2012 Smile Surveys – 3rd Grade Data only

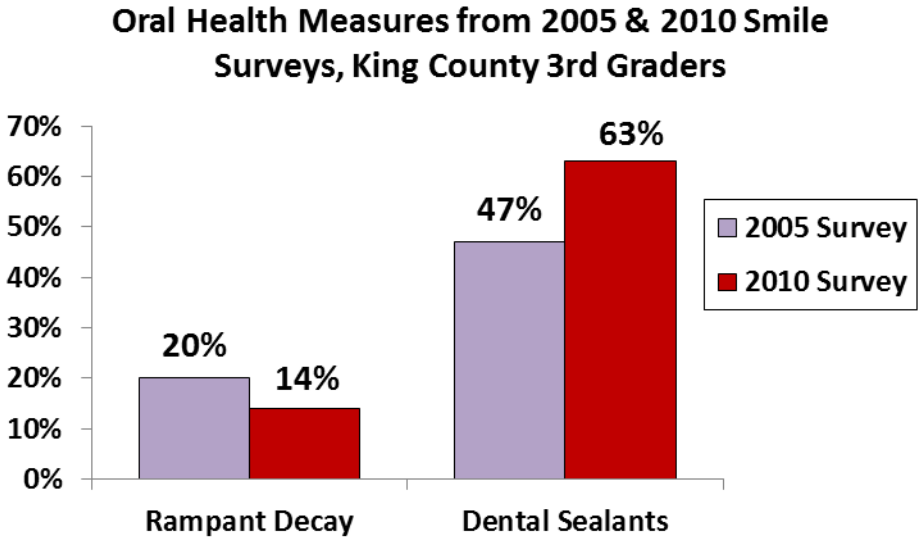
Comparisons between the 2005 and 2010 Smile Surveys should be done cautiously, as the subjects and sampling strategies differed. In 2005, the sample included 2nd and 3rd Graders while in 2010, the sample included Kindergarten and 3rd Graders. The following comparisons use data from 3rd Graders only, since disease patterns and use of Dental Sealants vary between Kindergarten students and 2nd graders.

From 2005 to 2010, there was no statistically significant difference in the King County rate of Caries Experience or Untreated Decay among 3rd Graders.. However, during this period the rate of Rampant Decay decreased by 30% and the rate of Dental Sealants increased by 34%.

Table 13: Oral Health Measures in 2005 and 2010 Smile Surveys, Screened King County Third Graders

Oral Health Measure	2005 (n= 938)	2010 (n=1,927)
Caries Experience	46% CI (NA)	47% CI (NA)
Treated Decay	39% **CI (16.7% - 44.9%)**	39% **CI (24.1% - 34.3%)**
Untreated Decay	16% CI (12.3% - 20.7%)	16% CI (13.9% - 19.0%)
*Rampant Decay	20% CI (17.4% - 22.6%)	14% CI (12.4% - 15.5%)
*Dental Sealants	47% CI (43.7% - 50.2%)	63% CI (60.3% - 64.7%)

*Significant difference between years



Comparing Oral Health Disparities, 2005 and 2010 Smile Surveys

While some oral health outcomes (Rampant Decay and Dental Sealants) have improved, disparities persist. The 2005 and 2010 Smile Survey data show continuing patterns of disproportionate disease levels in children by income, race/ethnicity and language spoken at home. The only oral health measure that showed no difference between groups was Dental Sealants. This finding probably reflects the location of school-based sealant programs in schools with lower-income children.

Disproportionate Burden of Disease on Low Income Children Continues

Between the 2005 and 2010 surveys, there were no significant changes in rate of Caries Experience, Treated or Untreated Decay between 3rd Graders eligible for free/reduced lunches and those not eligible. The income-related disparities in these outcomes remained unchanged.

Rampant Decay declined significantly in both groups but the income-related disparity did not disappear.

Table 14: Oral Health Measures by Survey Year and Free/Reduced Lunch Eligibility, Screened King County Third Graders

Oral Health Measure	2005 Not Eligible (n=624)	2010 Not Eligible (n=807)	2005 Eligible (n=311)	2010 Eligible (n=1120)
Caries Experience	**36%** CI (NA)	**36%** CI (NA)	**67%** CI (NA)	**62%** CI (NA)
Treated Decay	**31%** CI (13.1% - 38.7%)	**30%** CI (24.1% - 34.3%)	**54%** CI (21.0% - 66.3%)	**53%** CI (41.2% - 59.0%)
Untreated Decay	**9%** CI (6.1% - 14.4%)	**11%** CI (9.0% - 15.0%)	**29%** CI (21.1% - 40.6%)	**23%** CI (18.7% - 28.2%)
***Rampant Decay**	**13%** CI (10.8% - 16.3%)	**7%** CI (5.3% - 8.3%)	**33%** CI (27.7% - 38.4%)	**24%** CI (21.0% - 27.0%)
***Dental Sealants**	**50%** CI (46.0% - 54.0%)	**61%** CI (58.0% - 63.8%)	**41%** CI (35.0% - 46.2%)	**65%** CI (61.4% - 68.1%)

* Significant differences

In contrast, use of Dental Sealants increased in both groups, but was significantly higher in 2010 for low income students. In 2005, students ineligible for the Free Reduced Lunch program were significantly more likely to have Dental Sealants on their permanent first molars than were FRL-eligible students. Both groups showed increases in Dental Sealants between 2005 and 2010, but a much larger increase occurred within the group of students eligible for FRL programs (11% increase for non-eligible students and a 24% increase for students eligible for the FRL program.). The difference in rates of improvement may reflect an increase in the use of sealants in dental offices, but there has also been an increase in school based sealant programs specifically targeting schools with high FRL percentages through Public Health and Independent Hygienist Providers. These programs appear to be achieving their objective.

Oral Health Disparities Persist by Race/Ethnicity

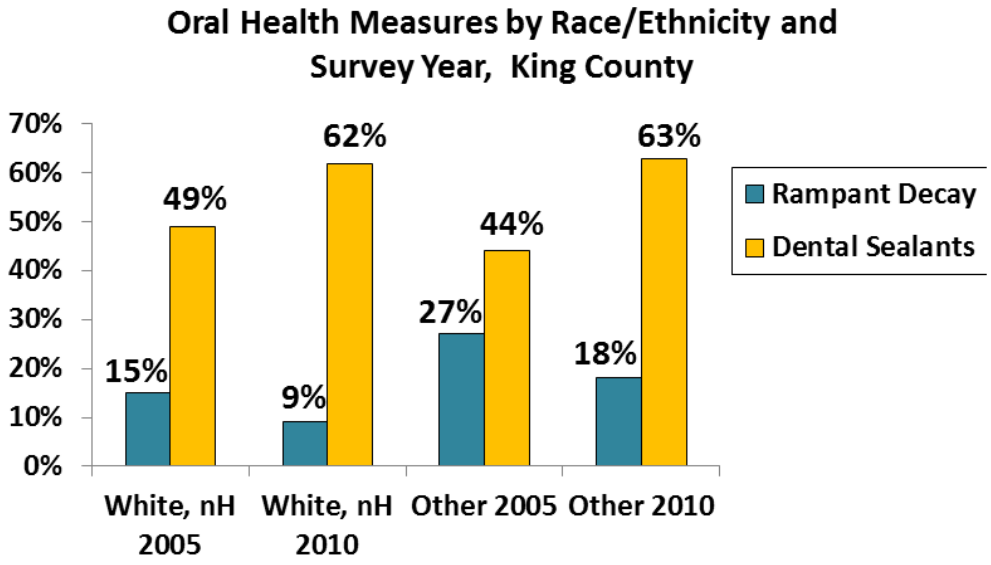
Disparities in oral health persist between White, non-Hispanic children and children of color. Between 2005 and 2010 there was significant improvement in each group, decreasing Rampant Decay and increasing Dental Sealants. But there was no change in Treated Decay, Untreated Decay or Caries Experience rates within each group between 2005 and 2010.

Table 15: Oral Health Measures by Survey Year and Race/Ethnicity, Screened King County Third Graders

Oral Health Measure	2005 White, non-Hispanic (n=564)	2010 White, non-Hispanic (n=2,308)	2005 Other Races /Ethnicities (n=374)	2010 Other Races/ Ethnicities (n=1937)
Caries Experience	**37%** CI (NA)	**38%** CI (NA)	**60%** CI (NA)	**55%** CI (NA)
Treated Decay	**31%** CI (12.3% - 39.5%)	**32%** CI (25.1% - 37.0%)	**49%** CI (21.1% - 60.6%)	**46%** CI (37.2% - 52.2%)
Untreated Decay	**11%** CI (7.2% - 16.8%)	**12%** CI (9.3% - 15.8%)	**24%** CI (16.9% - 32.9%)	**20%** CI (16.9% - 25.2%)
***Rampant Decay**	**15%** CI (12.4% - 18.5%)	**9%** CI (7.7% - 11.5%)	**27%** CI (22.6% - 31.9%)	**18%** CI (15.9% - 20.9%)
***Dental Sealants**	**49%** CI (44.5% - 52.9%)	**62%** CI (59.21% - 65.4%)	**44%** CI (39.3% - 49.6%)	**63%** CI (59.5% - 65.7%)

* Significant differences

White, non-Hispanic 3rd Graders have less disease (Caries Experience), greater access to care (Untreated Caries) and less severe disease (Rampant Caries) than do children of color. Part of the difference may be explained by a 2005-2010 increase in poverty (reflected in increased FRL eligibility) among children of color compared to White, non-Hispanic children.



Some Progress in Sealants and Rampant Decay among Children Speaking Language other than English, but Disparities Persist in Other Oral Health Measures

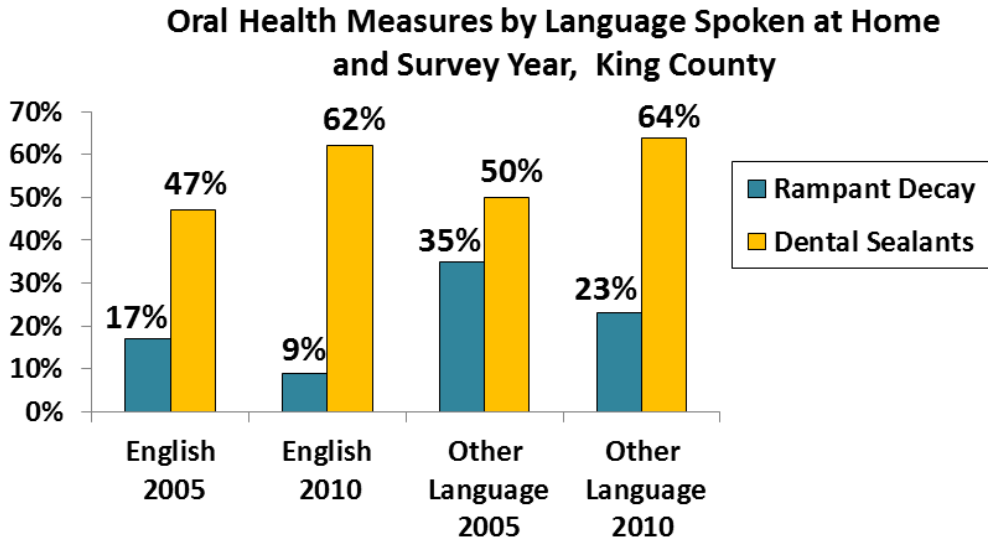
Between the 2005 and 2010 Smile Surveys there were significant reductions in Rampant Decay and increases in use of Dental Sealants among children whose primary home language is English and among those who speak another language at home. Despite this progress, language-related disparities persist in rates of Caries Experience, Treated Decay, Untreated Decay and Rampant Decay.

Table 16: Oral Health Measures by Survey Year and Language Spoken at Home, Screened King County Third Graders

Oral Health Measure	2005 English (n=798)	2010 English (n=1257)	2005 Other Language (n=141)	2010 Other Language (n=670)
Caries Experience	**42%** CI (NA)	**41%** CI (NA)	**71%** CI (NA)	**58%** CI (NA)
Treated Decay	**35%** CI (13.9% - 42.0%)	**34%** CI (27.7% - 38.5%)	**58%** CI (26.9% - 73.7%)	**49%** CI (37.6% - 56%)
Untreated Decay	**14%** CI (10.1% - 18.7%	**13%** CI (10.5% - 16.4%)	**29%** CI (17.4 - 46.3%)	**22%** CI (17.8% - 28.0%)
***Rampant Decay**	**17%** CI (14.8% - 20.1%)	**9%** CI (7.7% - 11.0%)	**35%** CI (26.9% - 43.2%)	**23%** CI (19.5% - 25.9%)
***Dental Sealants**	**47%** CI (43.0% - 50.0%)	**62%** CI (59.2% - 64.7%)	**50%** CI (41.1% - 58.2%)	**64%** CI (59.8% - 67.2%)

* Significant differences

The reasons for the decrease in Caries Experience and Rampant Decay for speakers of other languages are not clear. The increase in dental sealants may be due to school based sealant programs.



Preschool Survey – Head Start/ECEAP Programs

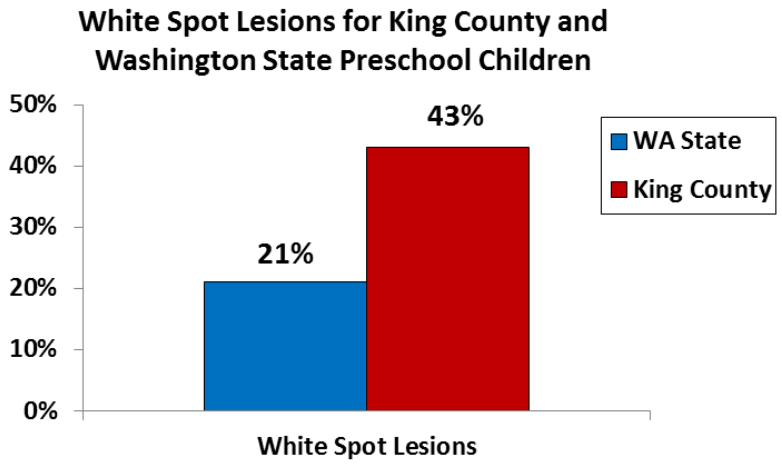
The preschool portion of the 2010 Smile Survey included 15 Head Start/ECEAP sites in King County with 382 children participating, giving a response rate of 72%. Sites were randomly selected using the state survey method. Parental consent was obtained. All screenings were conducted by dental professionals who had attended a DOH survey training session to assure consistency in measures. Data analysis used the EPI-INFO program produced by the CDC. Oral health measures included Caries Experience (evidence of treated or untreated decay), Treated Decay, Untreated Decay, Rampant Decay (treated or untreated decay on seven or more teeth), Early Childhood Caries (ECC) and White Spot Lesions. Early Childhood Caries (ECC) is characterized by dental decay on maxillary front teeth. It is associated with a virulent form of decay-causing bacteria and has been linked to particular infant feeding practices, especially bottle feeding during sleep time. White Spot Lesions are the initial breakdown of tooth enamel near the gum line. Not all lesions progress to decay.

King County children in Head Start/ECEAP programs and children in programs in other areas of the State showed similar rates of most oral health outcomes for this age group. There were significant differences between rates of White Spot Lesions: King County Head Start/ECEAP children were more than twice as likely to have White Spot Lesions. The reason for this difference is not known.

Table 17: Oral Health Measures in Screened Head Start/ECEAP Children, Washington State and King County

Oral Health Measure	State (n=1552)	King County (n=380)
Caries Experience	40% CI (37.8% - 42.8%)	37% CI (31.8% - 41.7%)
Treated Decay	31% CI (29.0% - 33.7%)	27% CI (22.3% - 31.4%)
Untreated Decay	13% CI (11.3% - 14.7%)	17% CI (13.3% - 21.1%)
Rampant Decay	17% CI (15.3% - 19.1%)	12% CI (8.9% - 15.0%)
Early Childhood Caries (ECC)	16% CI (13.7% - 17.4%)	12% CI (9.3% - 16.2%)
*White Spot Lesions	21% CI (18.4% - 22.7%)	43% CI (37.9% - 48.0%)

* Significant differences



The Healthy People 2020 (HP2020) objectives for preschool children ages 3 to 5 are 30% for Caries Experience and 21.4% for Untreated Decay. In the 2010 survey data, children in King County Head Start/ECEP programs had a higher rate of Caries Experience than the HP2020 objective, but they met the HP2020 objective for rate of Untreated Decay. It is important to note that the Healthy People 2020 objectives are applicable to all children ages 3 to 5 years old, regardless of family income, while the State and County Smile Surveys specifically target Head Start/ECEAP children from low-income families.

Differences by race/ethnicity and language spoken at home

The 2010 survey data found no significant difference in oral health outcomes by race/ethnicity among King County Head Start/ECEAP children.

Table 18: Oral Health Measures by Race/Ethnicity, Screened King County Head Start/ECEAP Children

Oral Health Measure	White, non-Hispanic n=47	Other Races/Ethnicities n=333
Caries Experience	**43%** CI (28.3% - 57.81%)	**36%** CI (30.6% - 41.2%)
Treated Decay	**30%** **CI (17.3% - 44.9%)**	**26%** **CI (21.4% - 31.1%)**
Untreated Decay	**21%** CI (10.7% - 35.7%)	**16%** CI (12.5% - 20.7%)
Rampant Decay	**19%** CI (9.1% - 33.3%)	**11%** CI (7.8% - 14.8%)
Early Childhood Caries (ECC)	**13%** CI (4.8% - 25.7%)	**12%** CI (9.1% - 16.4%)
White Spot Lesions	**45%** CI (30.2% - 59.9%)	**43%** CI (37.3% - 48.2%)

Head Start/ECEAP programs serve low-income children, and dental disease is strongly related to poverty. There is a disproportionate burden of disease for people of color, but it reflects the poverty that they experience, not their race or ethnicity. These Head Start/ECEAP data confirm that race/ethnicity is not the 'cause' of poorer oral health among low-income children.

As in the race/ethnicity comparisons, language spoken at home has no statistically significant relationship with oral health measures. Low income status of all Head Start/ECEAP children, not their language, explains vulnerability to dental disease.

Table 19: Oral Health Measures by Language Spoken at Home, Screened King County Head Start/ECEAP Children

Oral Health Measure	English n=162	Other Language n=217
Caries Experience	**34%** CI (26.7% - 41.8%)	**38%** CI (31.8% - 45.1%)
Treated Decay	**24%** **CI (17.7% - 31.4%)**	**28%** **CI (22.3% - 34.6%)**
Untreated Decay	**19%** CI (12.9% - 25.4%)	**16%** CI (11.1% - 21.2%)
Rampant Decay	**10%** CI (5.8% - 15.5%)	**13%** CI (8.7% - 18.1%)
Early Childhood Caries (ECC)	**11%** CI (6.7% - 17.0%)	**13%** CI (8.7% - 18.1%)
White Spot Lesions	**36%** CI (29.0% - 44.3%)	**48%** CI (40.7% - 54.3%)

Comparing Oral Health Disparities among Head Start/ECEAP Children, 2005 and 2010 Smile Surveys

Relative to the 2005 Survey, the 2010 Smile Survey for Head Start/ECEAP children found a 37% increase in Caries Experience, a 44% increase in Treated Decay, and a 50% increase in Rampant Decay. The rates of Untreated Decay and ECC did not change. White Spot Lesions were not measured in the 2005 Smile Survey.

Table 20: Oral Health Measures by Survey Year, King County Head Start/ECEAP Children

Oral Health Measure	2005 n=605	2010 n=380
Caries Experience	27% CI (23.2 – 30.4%)	37% CI (31.8% - 41.7%)
Treated Decay	15% CI (12.5% - 18.4%)	27% CI (22.3% - 31.4%)
Untreated Decay	15% CI (12.5% - 18.4%)	17% CI (13.3% - 21.1%)
Rampant Decay	6% CI (4.4% - 8.4%)	12% CI (8.9% - 15.0%)
Early Childhood Caries (ECC)	10% CI (12.7% - 21.4%)	12% CI (9.3% - 16.2%)

The rates of Treated Decay increased significantly between 2005 and 2010, while Untreated Decay rates were stable. Caries Experience and Rampant Decay include both Untreated and Treated Decay. The increase in Treated Decay contributed to the significant increases in Caries Experience and Rampant Decay.

The increase in Treated Decay in this age group deserves comment. The increase in treated decay may be a positive sign that children are getting the dental care they need. The increase may also reflect changes in practice. The measure Treated Decay registers evidence of treatment (fillings or extractions) but it is not possible to determine whether the treatment was performed because of existing disease or for preventive purposes. Dental providers often now do preventive restorations on very young children. Treating young children with extensive decay can require sedation, including general anesthesia, which can pose a health risk to the patient. Preventive restorations are thought to reduce the risk of future dental treatment that might require sedation.

Conclusions

The findings of the 2010 Smile Survey for King County indicate that children continue to be affected by dental disease, and suggest ways to prevent disease and improve children's dental health.

Key findings from the 2010 King County Smile Survey of elementary children include:

1. King County children enjoyed better oral health than children in other areas of the state.

Children in the King County sample had lower rates of Caries Experience and Rampant Decay and higher use of Dental Sealants than did children in the Washington State sample. Untreated Disease was the only oral health measure that found no significant difference between the King County and Washington State sample children. King County children age 6 to 9 exceeded the HP 2020 child oral health objectives in Caries Experience, Untreated Decay and Dental Sealants.

2. King County children from low-income families were at least twice as likely to have untreated dental disease as were those from families with higher income.

Eligibility for Free/Reduced Lunch programs was used as a proxy for income status in surveying school children. Children eligible for Free/Reduced Lunch programs in the King County sample were twice as likely to have untreated dental disease as were those not eligible. Untreated Decay is a measure reflective of access to care. The King County region has a range of dental programs and services offered to low-income families, including private dental offices, community dental clinics, Public Health dental clinics, the University of Washington Dental School and other dental programs. Despite these opportunities for care, the 2000, 2005 and 2010 Smile Surveys show that children from low-income families continue to have elevated rates of untreated dental disease compared to the general population. This suggests that barriers to child dental care extend beyond finding a provider.

3. King County children of color and children whose primary language was not English were almost twice as likely to have untreated dental disease as were non-Hispanic white children.

Dental disease is primarily a disease of poverty, and families of color, immigrants and refugees in King County are much more likely than non-Hispanic white families to be poor. The racial and ethnic disparities in childhood dental disease continue to be a significant problem. The 2000 and 2005 King County surveys revealed the problem, and the 2010 survey data showed no change in the pattern. Among minority groups, Hispanic/Latino children were likely to have more Caries Experience and more severe disease than African-American or Asian children. Much has been done to reach and educate the Hispanic community, but the results of the 2010 survey suggest that more still needs to be done to reduce dental disease in Hispanic/Latino children.

4. Dental Sealants did not follow the pattern of disease disparity among groups.

Use of Dental Sealants remains at a high level among Smile Survey participants, regardless of race/ethnicity, income or language. Increased general utilization of Dental Sealants has contributed to this as have school-based dental sealant programs that specifically target schools with children at higher risk for dental disease.

5. School-based dental sealant programs in King County were associated with significant increases in Dental Sealants among 3rd Graders.

Since 1986, Public Health has offered the school-based dental sealant program to targeted Seattle schools with children at high risk for dental disease. The program expanded to include targeted King County schools in 1995. Data from the 2000, 2005 and 2010 surveys indicated that children in schools with school-based sealant programs were more likely to have the protective benefits of Dental Sealants.

The increase in Treated Decay seen in the Smile Survey findings could be a result of increased decay activity in the children participating in the Survey. It could also reflect a trend toward more extensive treatment provided by dental professionals, influenced by reimbursement methods that reward aggressive treatment. The definition of a 'cavity' in dentistry has expanded from cavitation to include weak and stained grooves. Many school age children are now treated with occlusal fillings on their first molars, although they might be as well or better treated with preventive sealants.

Treatment is a measure of the ability to restore the damage due to dental disease, but does little to prevent the disease itself. Dental decay is a bacterial mediated process that destroys the enamel of a tooth, resulting in a cavity or hole. Restorative dentistry repairs the cavity or hole in the tooth structure without addressing the disease. It is common for children who have cavities at a young age to continue to get new cavities as they grow up, requiring more treatment.

From a Public Health perspective it is important that prevention and preventive services are emphasized. Dentistry is already moving in the direction of Caries Risk Assessment, antibacterial modalities and remineralization treatments in order to prevent dental disease. These, with dental sealants and community water fluoridation, continue to emphasize the prevention of dental disease rather than merely treating its results. In an age of emphasis on white fillings and cosmetic dentistry, it is important to continue the discussion over what is a cavity, to ensure that overtreatment does not occur. Lastly, we need a sustained focus on helping families achieve oral health behavior changes to address childhood oral disease.

Data Tables

Table 1.1
Elementary School Participation in Smile Survey 2010

	Number of Schools	Number Enrolled	Number Screened	Response Rate
Participating Schools	32	4,769	4,000	84%

Table 1.2
Enrollment and Free/Reduced Price Lunch Program Participation in all Elementary Schools in Sampling Frame, Sample Schools and Participating Schools

	K & 3rd Grade Enrollment	Percent on FRL	Percent White	Percent Hispanic	Percent African-American	Percent Asian	Percent Other Race
Schools in Sampling Frame (n=270)	38,380	33.7%	51.0%	14.6%	9.6%	17.3%	7.5%
Participating Schools (n=32)	4,769	40.1%	47.7%	17.6%	12.6%	15.9%	6.2%
Children Screened (n=4,000)	4,000	38.9%	51.0%	15.6%	12.6%	16.8%	4.0%

Table 1.3
Demographics of Screened Children

Variable	Kindergarten (n=2,073)		3rd Grade (n=1,927)		All Grades (n=4,000)	
	Number	Percent	Number	Percent	Number	Percent
Age						
5 years	891	43.0%	1	0.1%	892	22.3%
6 years	1,160	56.0%			1,160	29%
7 years	15	0.7%			15	0.4%
8 years	3	0.1%	779	40.5%	782	19.6%
9 years	1	0.05%	1,120	58.3%	1,121	28%
10 years			22	1.1%	22	0.6%
Missing	3	0.1%	5	0.2%	8	0.2%
Gender						
Male	1,049	50.6%	981	50.9%	2,030	50.8%
Female	1,023	49.3%	943	48.9%	1,966	49.2%
Missing/Unknown	1	0.05%	3	0.2%	4	0.1%
Free/Reduced Lunch Eligibility						
Not eligible	1,313	63.3%	1,120	58.1%	2,433	60.8%
Eligible	756	36.5%	799	41.5%	1,557	38.9%
Missing/Unknown	4	0.2%	8	0.4%	12	0.3%
Language Spoken at Home						
English	1,435	69.2%	1,257	65.2%	2,692	67.3%
Spanish	276	13.3%	240	12.5%	516	12.9%
Other	298	14.4%	363	18.8%	661	16.5%
Missing/Unknown	64	3.1%	67	3.5%	131	3.3%
Race/Ethnicity						
White, non-Hispanic	1,073	51.8%	965	50.1%	2,038	51%
African American	234	11.3%	271	14.1%	505	12.6%
Hispanic/Latino	342	16.5%	282	14.6%	624	15.6%
Asian	350	16.9%	322	16.7%	672	16.8%
American Indian/Alaska Native	30	1.4%	25	1.3%	55	1.4%
Other	40	1.9%	41	2.1%	81	2.0%
Missing/Unknown	4	0.2%	21	1.1%	25	0.6%

Table 1.4a
Oral Health Status of All Screened Children

	Number Screened (n=4,000)	Percent	Confidence Intervals
Caries free	2,411	60.3%	58.7% - 61.8%
Caries experience			
– primary and/or permanent teeth	1,589	39.7%	38.2% - 41.3%
Caries experience			
– permanent teeth	144	3.6%	3.1% - 4.2%
Treated decay	1239	31%	29.5% - 32.4%
Untreated decay	616	15.4%	14.3% - 16.6%
Rampant caries	506	12.7%	11.6% - 13.7%
Dental sealants	1,335	33.4%	31.9% - 34.9%
Treatment Need			
No obvious problem	3,385	84.6%	83.5% - 85.7%
Early dental care needed	587	14.7%	13.6% - 15.8%
Urgent dental care needed	28	0.7%	0.5% - 1.0%

Table 1.4b
Oral Health Status of All Screened Children -- Percentages Weighted for Non-Response

	Weighted %	Confidence Intervals
Caries free	59.8%	58.4% - 61.2%
Caries experience		
– primary and/or permanent teeth	40.2%	38.8% - 41.6%
Caries experience		
– permanent teeth	3.7%	3.2% - 4.2%
Treated decay	31.3%	30.0% - 32.6%
Untreated decay	15.6%	14.6% - 16.6%
Rampant caries	12.5%	11.6% - 13.4%
Dental sealants	33.8%	32.4% - 35.1%
Treatment Need		
No obvious problem	84.4%	83.4% - 85.4%
Early dental care needed	14.9%	13.9% - 15.9%
Urgent dental care needed	0.7%	0.5% - 0.9%

Table 1.5a
Oral Health Status of Screened Kindergarten and 3rd Grade Children Stratified by Grade

Total n=4,000	Kindergarten (n=2,073)			3rd Grade (n=1,927)		
	Number Screened	Percent	Confidence Intervals	Number Screened	Percent	Confidence Intervals
Caries free	1,385	66.8%	64.7% - 68.8%	1,026	53.2%	51.0% - 55.5%
Caries experience – primary and/or permanent teeth	688	33.2%	31.2% - 35.3%	901	46.8%	44.5% - 49.0%
Caries experience – permanent teeth	12	0.6%	0.3% - 1.0%	132	6.9%	5.8% - 8.1%
Treated decay	485	23.4%	21.6% - 25.3%	754	39.1%	36.9% - 41.4%
Untreated decay	304	14.7%	13.2% - 16.3%	312	16.2%	14.6% - 17.9%
Rampant caries	239	11.5%	10.2% - 13.0%	267	13.9%	12.4% - 15.5%
Dental sealants	130	6.3%	5.3% - 7.4%	1,205	62.5%	60.3% - 64.7%
Treatment Need						
No obvious problem	1,768	85.3%	83.7% - 86.8%	1,617	83.9%	82.2% - 85.5%
Early dental care needed	293	14.1%	12.7% - 15.7%	294	15.3%	13.7% - 17.0%
Urgent dental care needed	12	0.6%	0.3% - 1.0%	16	0.8%	0.5% - 1.4%

Table 1.5b
Oral Health Status of Screened Kindergarten and 3rd Grade Children, Stratified by Grade
With Percentages Weighted for Non-Response

Total n=4,000	Kindergarten N=2,073		3rd Grade (n=1,927)	
	Weighted %	Confidence Intervals	Weighted %	Confidence Intervals
Caries free	66.5%	64.7% - 68.4%	52.7%	50.6% - 54.7%
Caries experience – primary and/or permanent teeth	33.5%	31.6% - 35.3%	47.3%	45.3% - 49.4%
Caries experience – permanent teeth	0.6%	0.3% - 1.0%	7.0%	6.0% - 8.1%
Treated decay	23.5%	21.8% - 26.2%	39.6%	37.7% - 41.6%
Untreated decay	14.9%	13.5% - 16.3%	16.4%	14.9% - 17.9%
Rampant caries	11.2%	10.0% - 12.5%	13.9%	12.5% - 15.4%
Dental sealants	6.1%	5.2% - 7.1%	63.3%	61.3% - 66.2%
Treatment Need				
No obvious problem	85.1%	83.6% - 86.5%	83.7%	82.2% - 85.2%
Early dental care needed	14.4%	13.0% - 15.8%	15.5%	14.0% - 17.0%
Urgent dental care needed	0.5%	0.3% - 0.9%	0.8%	0.5% - 1.3%

Table 1.6a
Distribution of Treated Decay, Untreated Decay and Caries Experience
Among the Primary & Permanent Dentitions of Screened Children

	Kindergarten (n=2,073)		3rd Grade (n=1,927)		Both Grades (n=4,000)	
	Percent	Confidence Intervals	Percent	Confidence Intervals	Percent	Confidence Intervals
Treated Decay						
No treated decay	76.6%	74.7% - 78.4%	60.9%	58.6% - 63.1%	69.0%	67.6% - 70.5%
Primary teeth only	23.1%	21.3% - 24.9%	34.1%	32.0% - 36.3%	28.4%	27.0% - 29.8%
Primary and permanent teeth	0.3%	0.1% - 0.7%	4.0%	3.2% - 5.1%	2.1%	1.7% - 2.6%
Permanent teeth only	0	0	1.0%	0.6% - 1.6%	0.5%	0.3% - 0.8%
Untreated Decay						
No untreated decay	85.3%	83.7% - 86.8%	83.8%	82.1% - 85.4%	84.6%	83.4% - 85.7%
Primary teeth only	14.4%	13.0% - 16.0%	13.8%	12.3% - 15.4%	14.1%	13.1% - 15.3%
Primary and permanent teeth	0.1%	0.0% - 0.4%	1.0%	0.7% - 1.6%	0.6%	0.4% - 0.8%
Permanent teeth only	0.1%	0.0% - 0.5%	1.0%	0.9% - 2.0%	0.7%	0.5% - 1.1%
Caries Experience						
No caries experience	66.8%	64.7% - 68.8%	53.2%	51.0% - 55.5%	60.3%	58.7% - 61.8%
Primary teeth only	32.6%	30.6% - 34.7%	39.9%	37.7% - 42.1%	36.1%	34.6% - 37.6%
Primary and permanent teeth	0.5%	0.2% - 0.9%	5.5%	4.5% - 6.6%	2.9%	2.4% - 3.5%
Permanent teeth only	0.1%)	0.0% - 0.4%	1.3%	0.9% - 20.%	0.7%	0.5% - 1.0%

Table 1.6b
Distribution of Treated Decay, Untreated Decay and Caries Experience
Among the Primary & Permanent Dentitions of Screened Children Percentages Weighted for Non-Response

	Kindergarten (n=2,073)		3rd Grade (n=1,927)		Both Grades (n=4,000)	
	Weighted %	Confidence Intervals	Weighted %	Confidence Intervals	Weighted %	Confidence Intervals
Treated Decay						
No treated decay	76.5%	74.8% - 78.2	60.4%	58.4% - 62.3%	68.7%	67.4% - 70.0)
Primary teeth only	23.1%	21.5% - 24.8%	34.8%	32.8% - 36.7%	28.8%	27.5% - 30.0%
Primary and permanent teeth	0.3%	0.2% - 0.7%	3.9%	3.2% - 4.8%	2.1%	1.7% - 2.5%
Permanent teeth only	0	0	0.9%	0.6% - 1.4%	0.5%	0.3% - 0.7%
Untreated Decay						
No untreated decay	85.1%	83.7% - 86.5%	83.6%	82.1% - 85.1%	84.4%	83.4% - 85.4%
Primary teeth only	14.6%	13.3% - 16.1%	13.7%	12.4% - 15.2%	14.2%	13.2% - 15.2%
Primary and permanent teeth	0.1%	0.0% - 0.3%	1.2%	0.8% - 1.7%	0.6%	0.4% - 0.9%
Permanent teeth only	0.1%	0.0% - 0.4%	1.5%	1.0% - 2.1%	0.8%	0.6% - 1.1%
Caries Experience						
No caries experience	66.5%	64.7% - 68.4%	52.7%	50.6% - 54.7%	59.8%	58.4% - 61.2%
Primary teeth only	32.9%	31.1% - 34.8%	40.4%	38.4% - 42.4%	36.5%	35.2% - 37.9%
Primary and permanent teeth	0.5%	0.3% - 0.9%	5.7%	4.8% - 6.7%	3.0%	2.5% - 3.5%
Permanent teeth only	0.1%	0.0% - 0.3%	1.3%	0.9% - 1.9%	0.7%	0.5% - 1.0%

Table 1.7a
Oral Health of Kindergarten and 3rd Grade Screened Children Stratified by Race/Ethnicity
Number and Percent of Children

Variable Total n=3,975 (25 Missing/Unknown not included)	White non-Hispanic (n=2,038)	African American (n=505)	Hispanic/Latino (n=624)	Asian (n=672)	Other (n=136)
Caries experience – primary and/or perm	612 (30.0%) CI (28.1% - 32.1%)	228 (45.1%) CI (40.8% - 49.6%)	366 (58.7%) CI (54.7% - 62.5%)	301 (44.8%) CI (41.0% - 48.6%)	69 (50.7%) CI (42.0% - 59.4%)
Caries experience – permanent teeth	55 (2.7%) CI (2.1% - 3.5%)	30 (5.9%) CI (4.1% - 8.5%)	29 (4.6%) CI (3.2% - 6.7%)	23 (3.4%) CI (2.2% - 5.2%)	7 (5.1%) CI (2.1% - 10.3%)
Treated decay	474 (23.2%) CI (19.5% - 26.2%)	173 (34.3%) CI 26.9% - 41.8%	297 (47.6%) CI (40.0% - 54.3%)	225 (33.5%) CI (27.4% - 39.7%)	70 (42.5%) CI (32.1% - 58.4%)
Untreated decay	219 (10.7%) CI (9.5% - 10.7%)	96 (19.0%) CI (15.7% - 22.8%)	139 (22.3%) CI (19.1% - 25.8%)	136 (20.2%) CI (17.3% - 23.5%)	22 (16.2%) CI (10.4% - 23.5%)
Rampant caries	150 (7.4%) CI (6.3% - 8.6%)	60 (11.9%) CI (9.3% - 15.1%)	165 (26.4%) CI (23.1% - 30.1%)	105 (15.6%) CI (13.0% - 18.6%)	22 (16.2%) CI (10.4% - 23.5%)
Need early or urgent treatment	218 (10.7%) CI (9.4% - 12.1%)	96 (19.0%) CI (15.7% - 22.8%)	141 (22.6%) CI (19.4% - 26.1%)	135 (20.1%) CI (17.2% - 23.4%)	21 (15.4%) CI (9.8% - 22.6%)
Need urgent treatment	4 (0.2%) CI (0.1% - 0.5%)	7 (1.4%) CI (0.6% - 3.0%)	8 (1.3%) CI (0.6% - 2.6%)	7 (1.0%) CI (0.5% - 2.2%)	2 (1.5%) CI (0.2% - 5.2%)
Third Grade Children Only	n=965	n=271	n=282	n=322	n=66
Dental sealants	602 (62.4%) CI (59.2% - 65.4%)	175 (64.6%) CI (58.6% - 70.3%)	195 (69.1%) CI (63.4% - 74.5%)	186 (57.8%) CI (52.2% - 63.2%)	38 (57.6%) CI (44.8% - 69.7%)

Table 1.8a
Oral Health of Screened Kindergarten and 3rd Grade Children
Stratified by Race/Ethnicity

Variable Total n=3,975 (25 Missing/Unknown not included)	White non-Hispanic (n=2,038)	Confidence Intervals	Other Races/Ethnicities (n=1,937)	Confidence Intervals
Caries experience – primary and/or perm	612 (30.0%)	28.1% - 32.1%	964 (49.8%)	47.5% - 52.0%
Caries experience – permanent teeth	55 (2.7%)	2.1% - 3.5%	89 (4.6%)	3.7% - 5.6%
Treated decay	474 (23.2%)	19.3% - 26.2%	765 (39.0%)	33.6% - 42.5%
Untreated decay	219 (10.7%)	9.5% - 12.2%	393 (20.3%)	18.5% - 22.2%
Rampant caries	150 (7.4%)	6.3% - 8.6%	352 (18.2%)	16.5% - 20.0%
Need early or urgent treatment	218 (10.7%)	9.4% - 12.1%	393 (20.3%)	18.5% - 22.2%
Need urgent treatment	4 (0.2%)	0.1% - 0.5%	24 (1.2%)	0.8% - 1.9%
Third Grade Children Only	n=965		n=941	
Dental Sealants	602 (62.4%)	59.2% - 65.4%	594 (63.1%)	59.9% - 66.2%

Table 1.8b
Oral Health of Screened Kindergarten and 3rd Grade Children
Stratified by Race/Ethnicity
Percentages Weighted for Non-Response

Variable Total n=3,975 (25 Missing/Unknown not included)	White non-Hispanic Weighted %	Confidence Intervals	Other Races/Ethnicities Weighted %	Confidence Intervals
Caries experience – primary and/or perm	30.2%	28.3% - 32.0%	50.1%	48.1% - 52.1%
Caries experience – permanent teeth	2.6%	2.0% - 3.3%	4.8%	4.0% - 5.7%
Treated decay	23.4%	20.0% - 26.1%	39.1%	34.0% - 42.2%
Untreated decay	10.7%	9.6% - 12.1%	20.5%	18.9% - 22.1%
Rampant caries	7.2%	6.2% - 8.3%	17.8%	16.3% - 19.4%
Need early or urgent treatment	10.7%	9.54% - 12.0%	20.4%	18.9% - 22.1%
Need urgent treatment	0.2%	0.1% - 0.5%	1.1%	0.8% - 1.6%
Third Grade Children Only				
Dental Sealants	63.0%	60.1% - 65.7%	64.%	61.2% - 66.7%

Table 1.9a
Oral Health of Screened Kindergarten and 3rd Grade Children
Stratified by Language Spoken at Home

Variable Total n=3,869 (131 Missing/Unknown not included)	English (n=2,692)	Confidence Intervals	Other Language (n=1,177)	Confidence Intervals
Caries experience – primary and/or perm	885 (32.9%)	31.1% - 34.7%	657 (55.8%)	52.9% - 58.7%
Caries experience – permanent teeth	71 (2.6%)	2.1% - 3.3%	72 (6.1%)	4.8% - 7.7%
Treated decay	674 (25.1%)	21.7% - 27.6%	565 (43.2%)	36.3% - 47.6%
Untreated decay	335 (12.4%)	11.2% - 13.8%	268 (22.8%)	20.4% - 25.3%
Rampant caries	215 (8.0%)	.0% - 9.1%	283 (24.0%)	21.6% - 26.6%
Need early or urgent treatment	334 (12.4%)	11.2% - 13.7%	268 (22.8%)	20.4% - 25.3%
Need urgent treatment	11 (0.4%)	0.2% - 0.8%	16 (1.4%)	0.8% - 2.2%
Third Grade Children Only	n=1,257		n=603	
Dental Sealants	779 (62.0%)	59.2% - 64.7%	400 (66.3%)	62.4% - 70.1%

Table 1.9b
Oral Health of Screened Kindergarten and 3rd Grade Children
Stratified by Language Spoken at Home
Percentages Weighted for Non-Response

Variable Total n=3,869 (131 Missing/Unknown not included)	English Weighted %	Confidence Intervals	Other Language Weighted %	Confidence Intervals
Caries experience – primary and/or perm	33.3%	31.7% - 35.0%	55.7%	53.1% - 58.3%
Caries experience – permanent teeth	2.6%	2.1% - 3.2%	6.4%	5.2% - 7.8%
Treated decay	25.3%	22.2% - 27.6%	43.3%	36.8% - 47.3%
Untreated decay	12.7%	11.6% - 13.9%	22.6%	20.5% - 24.8%
Rampant caries	7.9%	7.0% - 8.0%	23.2%	21.1% - 25.4%
Need early or urgent treatment	12.6%	11.5% - 13.8%	22.6%	20.5% - 24.8%
Need urgent treatment	0.4%	0.2% - 0.7%	1.3%	0.8% - 2.0%
Third Grade Children Only				
Dental Sealants	62.2%	59.7% - 64.6%	67.8%	64.3% - 71.0%

Table 1.10a
Oral Health of Screened Kindergarten and 3rd Grade Children
Stratified by Eligibility for the FRL Program

Variable Total n=3,988 (12 Missing/Unknown not included)	Not Eligible (n=2,433)	Confidence Intervals	Eligible (n=1,555)	Confidence Intervals
Caries experience – primary and/or perm	704 (28.9%)	27.1% - 30.8%	879 (56.5%)	54.0% - 59.0%
Caries experience – permanent teeth	52 (2.1%)	1.6% - 2.8%	92 (5.9%)	4.8% - 7.2%
Treated decay	550 (22.6%)	19.5% - 25.2%	685 (44.0%)	37.3% - 48.1%
Untreated decay	249 (10.2%)	9.1% - 11.5%	363 (23.3%)	21.3% - 25.5%
Rampant caries	145 (6.0%)	5.1% - 7.0%	358 (23.0%)	21.0% - 25.2%
Need early or urgent treatment	247 (10.2%)	9.0% - 11.4%	364 (23.4%)	21.3% - 25.6%
Need urgent treatment	6 (0.2%)	0.1% - 0.6%	22 (1.4%)	0.9% - 2.2%
Third Grade Children Only	n=1,120		n=799	
Dental Sealants	686 (60.9%)	58.0% - 63.8%	520 (65.1%)	61.6% - 68.4%

Table 1.10b
Oral Health of Screened Kindergarten and 3rd Grade Children
Stratified by Eligibility for the FRL Program
Percentages Weighted for Non-Response

Variable Total n=3,988 (12 Missing/Unknown not included)	Not Eligible Weighted %	Confidence Intervals	Eligible Weighted %	Confidence Intervals
Caries experience – primary and/or perm	29.4%	27.7% - 31.0%	56.6%	54.4% - 58.9%
Caries experience – permanent teeth	2.2%	1.7% - 2.9%	5.9%	4.9% - 7.0%
Treated decay	22.9%	20.0% - 25.3%	44.1%	37.7% - 47.7%
Untreated decay	10.6%	9.5% - 11.7%	23.2%	21.3% - 25.1%
Rampant caries	6.0%	5.2% - 6.9%	22.3%	20.5% - 24.3%
Need early or urgent treatment	10.5%	9.4% - 11.7%	23.2%	21.3% - 25.1%
Need urgent treatment	0.2%	0.1% - 0.5%	1.3%	0.9% - 2.0%
Third Grade Children Only				
Dental Sealants	61.2%	58.5% - 63.8%	66.4%	63.3% - 69.3%

Table 2.1
Head Start and ECEAP Participation in Smile Survey 2010

	Number of Sites	Enrollment	Number Screened	Response Rate
Participating Sites	15	528	382	72%

Table 2.2
Age, Gender, Language Spoken at Home and Race/Ethnicity of Screened Head Start/ECEAP Children

Variable	All Children Screened		3-5 Year Olds Only	
	Number	Percent	Number	Percent
Age				
1 year				
2 years				
3 years	47	12.3%	47	12.4%
4 years	179	46.9%	179	47.1%
5 years	154	40.3%	154	40.5%
6 years	2	0.5%		
Gender				
Male	192	50.3%	192	50.5%
Female	190	49.7%	188	49.5%
Missing/Unknown				
Language Spoken at Home				
English	162	42.4%	162	42.6%
Spanish	99	25.9%	99	26.1%
Other	120	31.4%	118	31.1%
Missing/Unknown	1	0.3%	1	0.3%
Race/Ethnicity				
White non-Hispanic	47	12.3%	47	12.4%
African American	145	38.0%	145	38.2%
Hispanic/Latino	105	27.5%	105	78.2%
Asian	78	20.4%	76	20.0%
American Indian/Alaska Native	6	1.6%	6	1.6%
Other	1	0.3%	1	0.3%
Missing/Unknown				

Table 2.3
Oral Health Status of Screened Head Start and ECEAP Children

	All Children (n=382)	3-5 Year Olds Only (n=380)
	Percent of Children	Percent of Children
Caries free	63.4% CI (58.3% - 68.2%)	63.4% CI (58.3% - 68.2%)
Caries experience	36.6% CI (31.8% - 41.7%)	36.6% CI (31.8% - 41.7%)
Treated decay	26.4% CI (22.1% - 31.2%)	26.6% CI (22.3% - 31.4%)
Untreated decay	17.0% CI (13.5% - 21.2%)	16.8% CI (13.3% - 21.1%)
Rampant decay (or a history of)	11.8% CI (8.8% - 15.5%)	11.8% CI (8.9% - 15.6%)
Early childhood cavities	12.3% CI (9.3% - 16.1%)	12.4% CI (9.3% - 16.2%)
White spot lesions	42.9% CI (37.9% - 48.1%)	42.9% CI (37.9% - 48.0%)
Treatment Need		
No obvious problem	83.0% CI (78.8% - 86.6%)	83.2% CI (79.0% - 86.8%)
Early dental care needed	17.0% CI (13.5% - 21.2%)	16.8% CI (13.3% - 21.1%)
Urgent dental care needed	0	0

Table 2.4
Distribution of Treated and Untreated Decay among Screened Head Start/ECEAP Children
Number of Children (Percent of Total)

Treated Decay	Untreated Decay	
	No Untreated Decay	Untreated Decay
No Treated Decay	242 (63.4%)	39 (10.2%)
Treated Decay	75 (19.6%)	26 (6.8%)

Table 2.5
Oral Health Status of Screened Head Start and ECEAP Children Stratified by Race/Ethnicity, 3 to 5 Year Olds Only

Variable	White non-Hispanic (n=47)	African American (n=145)	Hispanic/Latino (n=105)	Asian (n=76)	Other (n=7)
	Percent of Children	Percent of Children	Percent of Children	Percent of Children	Percent of Children
Caries experience	42.6% CI (28.3% - 57.8%)	28.3% CI (21.1% - 36.3%)	44.8% CI (35.0% - 54.8%)	36.8% CI (26.1% - 48.7%)	42.9% CI (9.9% - 81.6%)
Treated decay	29.8% CI (17.3% - 44.9%)	21.4% CI (15.0% - 29.0%)	33.3% CI (24.4% - 43.2%)	24.4% CI (15.3% - 35.4%)	28.6% CI (3.7% - 71.0%)
Untreated decay	21.3% CI (10.7% - 35.7%)	12.4% CI (7.5% - 18.9%)	21.9% CI (14.4% - 31.0%)	15.8% CI (8.4% - 26.0%)	14.3% CI (0.4% - 57.9%)
Rampant caries	19.1% CI (9.1% - 33.3%)	8.3% CI (4.3% - 14.0%)	12.4% CI (6.8% - 20.2%)	11.8% CI (5.6% - 21.3%)	28.6% CI (3.7% - 71.0%)
Early childhood caries	12.8% CI (4.8% - 25.7%)	9.7% CI (5.4% - 15.7%)	13.3% CI (7.5% - 21.4%)	14.5% CI (7.5% - 24.4%)	28.6% CI (3.7% - 71.0%)
White spots	44.7% CI (30.2% - 59.9%)	34.5% CI (26.8% - 42.8%)	55.2% CI (45.2% - 65.0%)	39.5% CI (28.4% - 51.4%)	57.1% CI (18.4% - 90.1%)
Need early or urgent treatment	21.3% CI (10.7% - 35.7%)	12.4% CI (7.5% - 18.9%)	21.9% CI (14.4% - 31.0%)	15.8% CI (8.4% - 26.0%)	14.3% CI (0.4% - 57.9%)
Need urgent treatment	0	0	0	0	0

Table 2.6
Oral Health Status of Screened Head Start and ECEAP Children Stratified by Race/Ethnicity, 3 to 5 Year Olds Only

Variable	White Non-Hispanic (n=47)	Other Races/Ethnicities (n=333)
	Percent of Children	Percent of Children
Caries experience	42.6% CI (28.3% - 57.8%)	35.7% CI (30.6% - 41.2%)
Treated decay	29.8% CI (17.3% - 44.9%)	26.0% CI (24.1% - 31.1%)
Untreated decay	21.3% CI (10.7% - 35.7%)	16.2% CI (12.5% - 20.7%)
Rampant caries	19.1% CI (9.1% - 33.3%)	10.8% CI (7.8% - 14.8%)
Early childhood caries	12.8% CI (4.8% - 25.7%)	12.3% CI (9.1% - 16.4%)
White spots	44.7% CI (30.2% - 59.9%)	42.6% CI (37.3% - 48.2%)
Need early or urgent treatment	21.3% CI (10.7% - 35.7%)	16.2% CI (12.5% - 20.7%)
Need urgent treatment	0	0

Table 2.7
Oral Health Status of Screened Head Start and ECEAP Children Stratified by Language, 3 to 5 Year Olds Only

Variable	English (n=162)	Other Language (n=217)
	Percent of Children	Percent of Children
Caries experience	34.0% CI (26.7% - 41.8%)	38.2% CI (31.8% - 45.1%)
Treated decay	24.1% CI (17.7% - 31.4%)	28.2% CI (22.3% - 34.6%)
Untreated decay	18.5% CI (12.9% - 25.4%)	15.7% CI (11.1% - 21.2%)
Rampant caries	9.9% CI (5.8% - 15.5%)	12.9% CI (8.7% - 18.1%)
Early childhood caries	11.1% CI (6.7% - 17.0%)	12.9% CI (8.7% - 18.1%)
White spots	36.4% CI (29.0% - 44.3%)	47.5% CI (40.7% - 54.3%)
Need early or urgent treatment	18.5% CI (12.9% - 25.4%)	15.7% CI (11.1% - 21.2%)
Need urgent treatment	0	0

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